

Description of a new *Tegenaria* Latreille, 1804 from southern Turkey with remarks on the *Tegenaria ariadnae* species-complex (Arachnida, Araneae)

Dragomir Dimitrov¹

¹ National Museum of Natural History, Bulgarian Academy of Sciences, 1 Tsar Osvoboditel Blvd, 1000 Sofia, Bulgaria

Corresponding author: Dragomir Dimitrov (dimitrov@nmnhs.com)

Academic editor: Pedro Cardoso | Received 15 March 2020 | Accepted 24 April 2020 | Published 21 May 2020

<http://zoobank.org/36B3E809-A5AB-4013-9B8F-95991EEB429B>

Citation: Dimitrov D (2020) Description of a new *Tegenaria* Latreille, 1804 from southern Turkey with remarks on the *Tegenaria ariadnae* species-complex (Arachnida, Araneae). ZooKeys 935: 47–55. <https://doi.org/10.3897/zookeys.935.52089>

Abstract

A new cave-dwelling species of *Tegenaria*, *T. lazarovi* **sp. nov.**, is described from southern Turkey, based on both sexes. The new species belongs to the *T. ariadnae* species-complex which is distributed in the Eastern Mediterranean (Crete, northern Libya). The new species is compared to its morphologically closest congeners. New taxonomically relevant pictures are given for two of them. The distribution of the *Tegenaria ariadnae* species-complex is summarized and discussed.

Keywords

Cave fauna, endemic, funnel weaver spiders, new species, taxonomy

Introduction

With 112 valid species (WSC 2020), *Tegenaria* Latreille, 1804 is one of the largest genera in the spider family Agelenidae. The genus is very species-rich in Turkey. Demir and Seyyar (2017) listed 31 species, Özkütük et al. (2017) and Topçu and Demircan (2018) added two more, increasing the number of known species from the country to 33. Many of these species are known by one sex only. Especially high is the number of species where only the female is known (12 spp.), while in just one species only the male is known. The

remaining 20 species are known by both sexes. The species known only by females are described mostly from caves by Brignoli (1972b, 1977, 1978a, 1978b) and the absence of the male sex is a cause of certain difficulties in the taxonomy of the genus.

While processing unidentified material collected in 2006 by my colleagues Stoyan Lazarov and Pavel Stoev in Turkish caves, I discovered an unknown *Tegenaria* species captured in an unnamed cave situated between Anamur and Silifke, southern Turkey. The species is described below and its possible relationships, as well as the distribution of the *T. ariadnae* species-complex, are discussed.

Material and methods

The material was preserved in vials with 80% ethanol in the field. The specimens were examined and measured using a Wild M5A stereomicroscope; all measurements are in mm. Pictures were taken with a Canon EOS 1100D digital camera attached to a Carl Zeiss Amplitval microscope. The drawings were executed on a Wacom tablet and using Adobe Illustrator graphic design software. The map was generated with the SimpleMappr API. Colour was described from specimens preserved in ethanol. The male palp and epigyne were dissected in order to be studied and illustrated. The epigyne was cleared in lactic acid. Leg measurements formula: total length (coxa + trochanter, femur, patella, tibia, metatarsus, tarsus). Tarsus length includes claws.

Abbreviations: Morphology. **ALE** – anterior lateral eyes, **AME** – anterior median eyes, **C** – conductor, **CO** – copulatory openings, **DBTA** – dorsal branch of the tibial apophysis, **DPC** – dorsal part of terminal end of the conductor, **LBTA** – lateral branch of the tibial apophysis, **MA** – median apophysis, **MPE** – median plate of epigyne, **PLE** – posterior lateral eyes, **PME** – posterior median eyes, **R** – receptacles, **VPC** – ventral part of terminal end of the conductor.

Institutions. **MBCG** – Museo Civico Scienze Naturali Enrico Caffi, Bergamo, Italy; **MCSN** – Museo Civico di Storia Naturale, Verona, Italy; **NMNHS** – National Museum of Natural History, Sofia, Bulgaria; **SMF** – Senckenberg Research Institute, Frankfurt, Germany.

Taxonomy

Family Agelenidae C. L. Koch, 1837

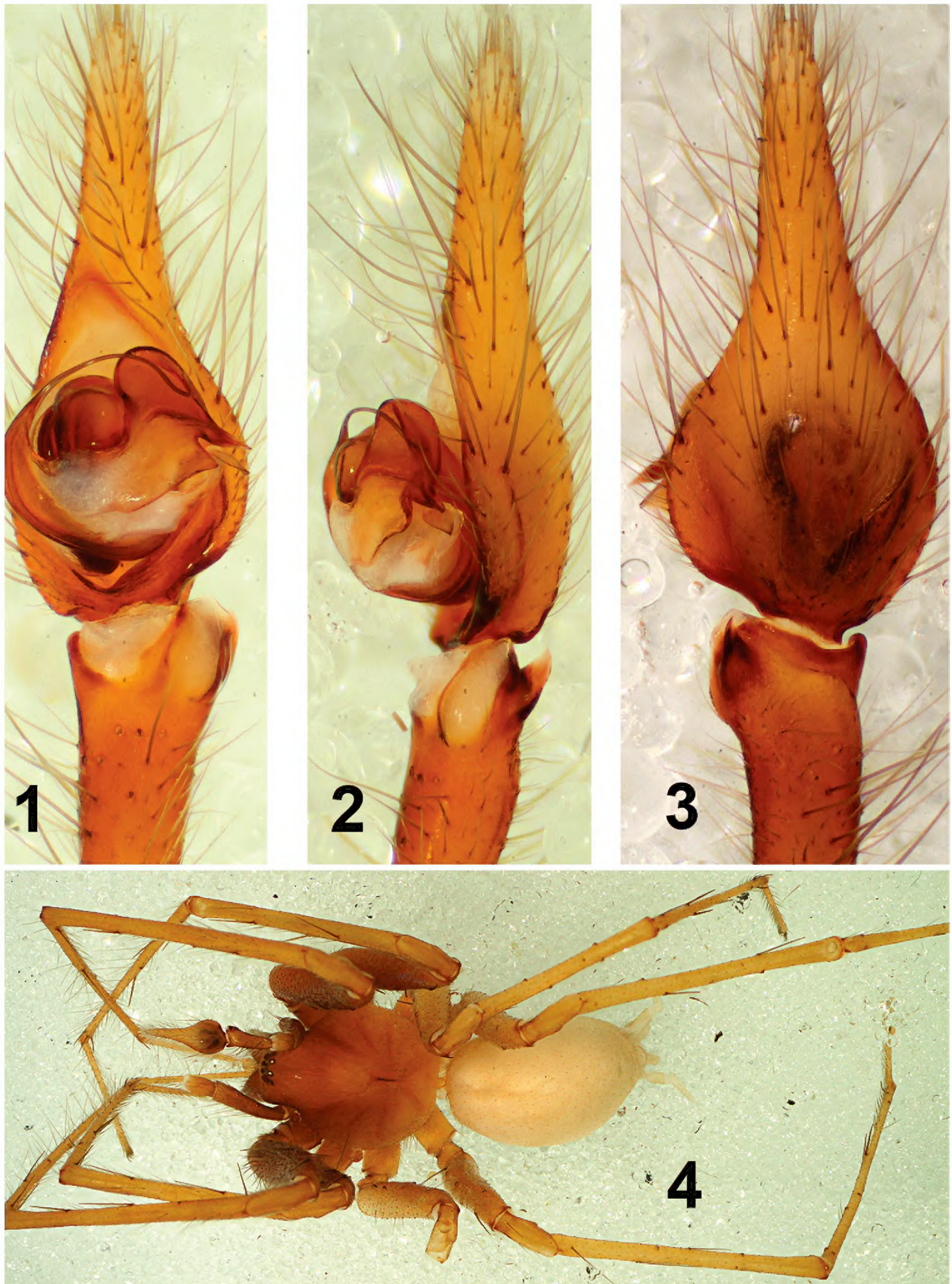
Genus *Tegenaria* Latreille, 1804

Tegenaria lazarovi sp. nov.

<http://zoobank.org/CADBD8E5-2299-4BC4-AFF6-9CFCAA55D011>

Figs 1–6

Type material. ♂ holotype, 2 ♀ paratypes, Turkey, Silifke distr., Karatepe village, unnamed cave on the left side of the road Anamur-Silifke, Akçalı Dağları Mts. 36;



Figures 1–4. *Tegenaria lazarovi* sp. nov. male holotype. Palp ventral (**1**), palp retrolateral (**2**), palp dorsal (**3**), habitus (**4**).

36°10'55"N, 33°26'41"E, altitude 182 m, wet sand; 16.07.2006; P. Stoev and S. Lazarov leg. (NMNHS); 1 ♀ paratype, the same data as holotype (SMF).



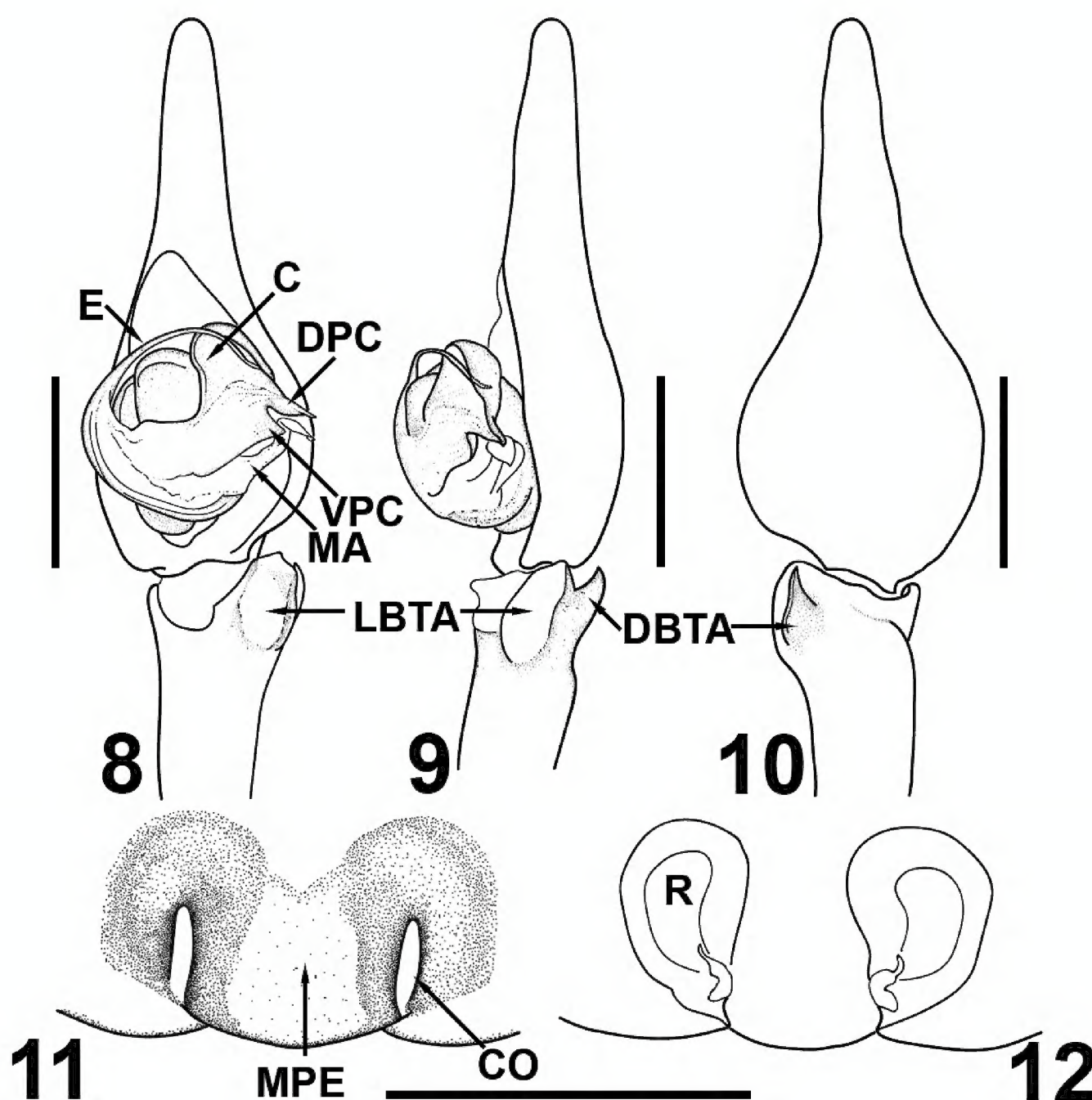
Figures 5–7. *Tegenaria lazarovi* sp. nov. female paratype. Epigyne ventral (5), vulva dorsal (6), habitus (7).

Other material. 3 ♀ juveniles, the same data as holotype (NMNHS).

Comparative material examined. *Tegenaria vallei* Brignoli, 1972. ♂ holotype, Libya, Cyrenaica, Lete Cave, Benghazi, 06.04.1966, Valle and Bianchi leg., 1 ♂ paratype, the same locality as holotype, 31.12.1967, Valle leg. (MBCG); 1 ♀ paratype, the same locality as holotype, 31.12.1967, Valle leg. (MCSN); *Tegenaria pieperi* Brignoli, 1979. ♀ holotype, Crete, Sitia, Agios Georgios, Megalo Katafigi Cave, 21.05.1977, H. Pieper leg. (MCSN).

Etymology. The species is dedicated to my colleague, Bulgarian arachnologist Stoyan Lazarov who provided me with the type material. He was chosen over Pavel Stoev by tossing a coin.

Diagnosis. The new species fits well in the genus *Tegenaria* as defined by Bolzern, Burckhardt and Hänggi (2013) according to its straight trochanters, the absence of dorsal spines on the patellae and the shape of the conductor. It appears closest to *Tegenaria ariadnae* Brignoli, 1984. The males can be separated by the following characters: (1) The DBTA of *Tegenaria lazarovi* sp. nov. is claw-shaped, with a sharp tip (Figs 2, 3, 9, 10), while in *T. ariadnae* it is more massive and with a blunt tip (Bolzern, Burckhardt and Hänggi 2013: 769, fig 14R); (2) A lighter, less sclerotized LBTA (Figs 1, 2, 8, 9), more sclerotized in *T. ariadnae* (Bolzern, Burckhardt and Hänggi 2013: 769, fig 14R, 16M); (3) A pointed, triangular VPC (Figs 1, 8), trapezoid in *T. ariadnae*



Figures 8–12. *Tegenaria lazarovi* sp. nov. Male holotype (8–10). Palp ventral (8), palp retrolateral (9), palp dorsal (10). Female paratype (11, 12). Epigyne ventral (11), vulva dorsal (12) Scale bars: 1.0 mm.

(Bolzern, Burckhardt and Hänggi 2013:769, fig 14Q); the females of the two species can be separated by (4) the trapezoid epigynal median plate (MPE) with a broader distal part in *Tegenaria lazarovi* sp. nov. (Figs 5, 11), which in *T. ariadnae* is broader in the basal part (Bolzern, Burckhardt and Hänggi 2013:769, fig 14S); (5) The copulatory openings are perpendicular to the MPE and positioned to its distal part (Figs 5, 11) while in *T. ariadnae* they are horizontal, positioned much higher (Bolzern, Burckhardt and Hänggi 2013: 769, fig 14S); (6) The receptacles are larger, kidney-shaped (Figs 6, 12) while being smaller and more oval in *T. ariadnae* (Bolzern, Burckhardt and Hänggi 2013: 769, fig 14T, 16D).

Description. Male. Measurements. Total length (including spinnerets) 7.66; carapace length 3.23, width 2.50; chelicerae length 1.43; clypeus height 0.22; eye diam-



Figures 13–18. *Tegenaria vallei* Brignoli, 1972 (**13–17**) Male holotype (**13–15**) palp ventral (**13**) palp retrolateral (**14**) palp dorsal (**15**) Female paratype (**16, 17**) epigyne ventral (**16**) vulva dorsal (**17**) *Tegenaria pieperi* Brignoli, 1979 female holotype, epigyne ventral (**18**).

eters AME 0.075, ALE 0.090, PME 0.090, PLE 0.090; AE separated from each other by 0.020, ALE almost touching PLE, PME separated from each other by 0.14 and from PLE by 0.080; abdomen length 4.43 (including spinnerets), width 2.05; Leg measurements I 20.71 (1.65, 5.55, 1.13, 4.80, 4.80, 2.40), II 16.96 (1.50, 4.13, 1.25, 3.75, 4.15, 2.18), III 15.79 (1.45, 3.75, 1.13, 3.45, 3.90, 2.10); IV 22.55 (1.58, 4.88, 1.13, 4.60, 5.40, 2.48). Leg spination typical for the genus. Coloration (Fig. 4). Carapace light brown to yellow, darker in the anterior half, gradually lightening posteriorly. Chelicerae light brown. Legs I, II light brown, legs III, IV yellow. Sternum without pattern, yellow in the center, gradually darkening to light brown at the edges. Palpal femur light brown, other segments gradually lightening, yellowish. Abdomen white, without pattern. Other somatic characters. Chelicerae with 2–3 promarginal and 5 retromarginal teeth. All trochanters straight. Colulus is a single trapezoid plate, slightly notched in the middle of the distal part. Palp (Figs 1–3, 8–10). Femur length 1.80; pa-

tella length 0.60; tibia length 2.03; cymbium length 2.93. Tibia with short retrolateral apophysis with dorsal and lateral branches. Dorsal branch (DBTA) claw-shaped with sharp end. Lateral one (LBTA) rounded, less chitinized, whitish, surrounded by a light brown more sclerotized strip (Figs 2, 3, 9, 10). Cymbium long and narrow with a slight depression dorsally (Figs 2, 9). Embolus comparatively long and thin, originating at 9 o'clock and ending at 2 o'clock position. Conductor short and broad, distal portion rounded, both dorsal and ventral part of terminal end sharp. MA membranous, long and narrow, ending in a more chitinized plate, situated between the dorsal and ventral part of the conductor's terminal end (Figs 1, 8).

Female. Measurements. Total length (including spinnerets) 8.30; carapace length 3.80, width 2.50; chelicerae length 0.88; clypeus height 0.29; eye diameters and arrangement as in male; abdomen length 4.50 (including spinnerets) width 2.25; Leg measurements I 19.14 (1.58, 4.50, 1.13, 5.63, 4.50, 1.80), II 16.71 (1.58, 4.05, 1.13, 3.90, 3.90, 2.15), III 15.41 (1.50, 3.60, 1.13, 3.38, 3.90, 1.90); IV 22.81 (1.73, 4.80, 1.13, 4.65, 5.25, 2.25). Leg spination typical for the genus. Female palpal tibia with 2 dorsal and 2 prolateral spines. Coloration (Fig 7). Carapace, chelicerae and sternum as in male. All legs yellow. Palpal femur, patella and tibia yellow, tarsus light brown. Abdomen whitish to light gray, darker than in male, without pattern. Median plate of epigyne light brown, framed laterally by dark brown spots. Other somatic characters. Chelicerae with 3 promarginal and 5 retromarginal teeth. All trochanters straight. Colulus is a single trapezoid plate, slightly notched in the middle of the distal part. Epigyne and vulva (Figs 5, 6, 11, 12). Width 0.98. Epigynal median plate trapezoid, with M-shaped base, broader in the distal part. Copulatory openings vertical, situated on both sides of the median plate (Figs 5, 11). Posterior sclerite absent. Receptacles large and oval (Figs 6, 12).

Distribution. Known only from the type locality in southern Turkey.

Remarks. Two *Tegenaria* species known from Crete, namely *Tegenaria pieperi* Brignoli, 1979 and *Tegenaria schmalfussi* Brignoli, 1976 are also similar to *T. ariadnae* and *T. lazarovi* sp. nov. *Tegenaria pieperi* Brignoli, 1979 is known only by the female which differs from *T. lazarovi* sp. nov. by the rectangular MPE and the smaller and much higher positioned receptacles (Fig 18). The male of *T. schmalfussi* differs from *T. lazarovi* sp. nov. by the lack of VPC and the smaller DBTA and LBTA (Bosmans et al. 2013, figs 50–52); the female can be distinguished by the smaller MPE and different shape of the receptacles (Bosmans et al. 2013, figs 53–54). I would include in this species complex also *Tegenaria vallei* Brignoli, 1972, known from a cave near Benghazi, Libya. Its male can be distinguished by having conductor with entirely missing VPC (Fig. 13) and different DBTA and LBTA (Figs 14, 15). The female differs by the oval MPE (Fig. 16) and the longer receptacles (Fig. 17). The *T. ariadnae* species-complex has a typical Eastern Mediterranean distribution with three species known from Crete, one from northern Libya and one from southern Turkey (Fig 19). It is interesting that *T. lazarovi* sp. nov. appears more closely related to species inhabiting Crete and northern Libya than to any of the *Tegenaria* species known from the Turkish mainland. However, the current knowledge of the spider fauna of the easternmost Mediterranean (especially in north-eastern Africa) is insufficient to provide an explanation for this observation.



Figure 19. Distribution of the *Tegenaria ariadnae* species-complex.

Acknowledgements

I thank my colleagues Stoyan Lazarov and Pavel Stoev (NMNHS) for collecting the type material, Leonardo Latella (MCSN) and Paolo Pantint (MBCG) for sending me comparative material of *T. vallei* and *T. pieperi*, and Zdravko Kolev (NMNHS) for the linguistic improvements. Many thanks also to Angelo Bolzern (Naturhistorisches Museum, Basel, Switzerland) and another anonymous reviewer for reviewing the manuscript and suggesting some useful improvements.

This study was partially supported by the Bulgarian Ministry of Education and Science under the National Research Program “Young scientists and postdoctoral students” approved by DCM # 577/17.08.2018, and by the projects “Cybertaxonomic approach to phylogenetic studies of model invertebrate genera (Invertebrata, Arachnida, Insecta), clarifying the problems of origin, formation and conservation of the invertebrate fauna of the Balkan Peninsula” (National Science Fund, Ministry of Education, Youth and Science of the Republic of Bulgaria, Grant KP-06-H21/1-17.12.2018).

References

- Bolzern A, Burckhardt D, Hänggi A (2013) Phylogeny and taxonomy of European funnel-web spiders of the *Tegenaria-Malthonica* complex (Araneae: Agelenidae) based upon morphological and molecular data. *Zoological Journal of the Linnean Society* 168: 723–848. <https://doi.org/10.1111/zoj.12040>
- Bosmans R, Van Keer J, Russell-Smith A, Kronstedt T, Alderweireldt M, Bosselaers J, De Koninck H (2013) Spiders of Crete (Araneae). A catalogue of all currently known species

- from the Greek island of Crete. Nieuwsbrief van de Belgische Arachnologische Vereniging 28(1): 1–147.
- Brignoli PM (1972a) Una nuova *Tegenaria* cavernicola della Cirenaica (Araneae, Agelenidae). Fragmenta Entomologica 8(3): 157–160.
- Brignoli PM (1972b) Terzo contributo alla conoscenza dei ragni cavernicoli di Turchia (Araneae). Fragmenta Entomologica 8: 161–190.
- Brignoli PM (1976) Ragni di Grecia IX. Specie nuove o interessanti delle famiglie Leptonetidae, Dysderidae, Pholcidae ed Agelenidae (Araneae). Revue Suisse de Zoologie 83(3): 539–578. <https://doi.org/10.5962/bhl.part.91452>
- Brignoli PM (1977) Ragni di Grecia X. Nuovi dati sulla Grecia continentale ed insulare (Araneae). Revue Suisse de Zoologie 84: 937–954. <https://doi.org/10.5962/bhl.part.91369>
- Brignoli PM (1978a) Ragni di Turchia IV. Leptonetidae, Dysderidae ed Agelenidae nuovi o interessanti di grotte della Turchia meridionale (Araneae). Quaderni di Speleologia, Circolo Speleologico Romano 3: 37–54.
- Brignoli PM (1978b). Ragni di Turchia V. Specie nuove o interessanti, cavernicole ed epigee, di varie famiglie (Araneae). Revue Suisse de Zoologie 85(3): 461–541. <https://doi.org/10.5962/bhl.part.82243>
- Brignoli PM (1979) Ragni di Grecia XI. Specie nuove o interessanti, cavernicole ed epigee. Revue Suisse de Zoologie 86(1): 181–202. <https://doi.org/10.5962/bhl.part.82285>
- Brignoli PM (1984) Ragni di Grecia XII. Nuovi dati su varie famiglie (Araneae). Revue Suisse de Zoologie 91(2): 281–321. <https://doi.org/10.5962/bhl.part.81881>
- Demir H, Seyyar O (2017) Annotated Checklist of the Spiders of Turkey. Munis Entomology and Zoology 12(2): 433–469.
- Koch CL (1837) Übersicht des Arachnidensystems. C. H. Zeh'sche Buchhandlung, Nürnberg, Heft 1, 1–39. <https://doi.org/10.5962/bhl.title.39561>
- Latreille PA (1804) Tableau methodique des Insectes. Nouveau Dictionnaire d'Histoire Naturelle, Paris 24: 129–295.
- Özkütük RS, Elverici M, Kunt KB, Kiliç G (2017) First faunistic record of *Tegenaria vankeerorum* Bolzern, Burckhardt & Hänggi, 2013 (Araneae: Agelenidae) from Turkey with description of unknown female. Biological Diversity and Conservation 10(3): 178–183.
- Topçu A, Demircan N (2018) New records of family Agelenidae for the spider fauna of Turkey (Araneae: Agelenidae). Indian Journal of Arachnology 6(2017): 20–22.
- WSC (2020) World Spider Catalog. Version 21.0. Natural History Museum Bern. <http://wsc.nmbe.ch> [accessed on 08 March 2020]